Notes ichtyologiques / *Ichthyological notes*

First record of a synaphobranchid eel in the Arctic: *Diastobranchus capensis* caught near Spitsbergen

by

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RÉSUMÉ. - Première observation de *Diastobranchus capensis*, un synaphobranchidé capturé près du Spitzberg (Arctique).

En 2005, un spécimen de *Diastobranchus capensis* (longueur totale 89,4 cm) a été capturé à la latitude 77°44' N, sur le talus continental à l'ouest du Spitzberg. C'est la première observation de ce Synaphobranchidae dans l'Arctique, loin au nord de l'aire de répartition habituelle de cette espèce de l'hémisphère sud.

Key words. - Synaphobranchidae - *Diastobranchus capensis* - Arctic - First record.

Eels of the family Synaphobranchidae (Anguilliformes) are demersal deep-sea fishes living on continental slopes down to abyssal depths from cold temperate to tropical regions (Sulak and Shcherbachev 1997). Two species of the family (*Synaphobranchus affinis* and *Histiobranchus bathybius*) have been recorded from near the Pribilof Islands, Alaska (Mecklenburg *et al*., 2002), and *Synaphobranchus kaupii* is recorded as far north as 66°37'N in the Davis Strait (Robins and Robins, 1989). However, no synaphobranchid eels seem to have been reported from the Arctic (cf. ichthyofaunal definition of the Arctic by Mecklenburg *et al*., 2010). In 2005, a specimen of *Diastobranchus capensis* Barnard, 1923 was caught west of Spitsbergen. It represents the first record of a synaphobranchid eel in Arctic waters, a long distance from the known regular distribution range of this species.

The specimen (Fig. 1) was caught alive in a Campelen 1800 bottom trawl, 19 August 2005, at 77°44'N-10°12'E (Fig. 2), on a fishery research cruise carried out by the Institute of Marine Research, Bergen, with the R/V "Jan Mayen". The trawl had 40-m sweeps and a cod-end equipped with a 22-mm mesh size inner lining. Gear depth was 682-666 m. A nearby CTD station (77°20'N-10°20'E; R/V "Johan Hjort", Station 844) two days earlier showed temperature between 0°C and -0.5°C at this depth. The specimen was brought to Bergen Museum for identification and after final preservation was included in the museum collections (catalogue number ZMUB 16181).

The species identification was done from the following diagnostic characters (Robins and Robins, 1989; Sulak and Shcherbachev, 1997): Gill slits distinctly separate and oblique, ventrolaterally positioned; vent positioned on the anterior 1/4 of the total length; pectoral fins long, the tip reaching the vent; origin of dorsal fin well posterior to the vent; mouth extending past the posterior margin of eye; narrow elongated scales in a basket-weave pattern.

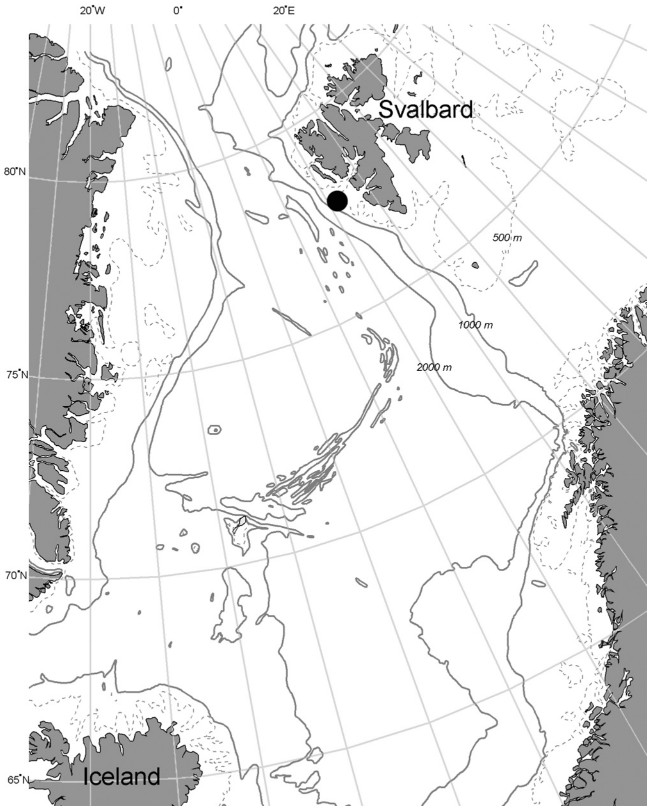

Figure 2. - Norwegian Sea and Svalbard region showing the location (black dot) where the specimen of *Diastobranchus capensis* was caught.

The total length of the specimen was 894 mm. Measurements taken according to Böhlke (1989), and meristic counts, are given in table I. Newly caught, its body colour was a greenish grey with some metallic shine. After fixation in formalin and storage in ethanol, the body colour of the specimen turned into a very dark brown with blackish fins and blackish areas around the gill slits and vent.

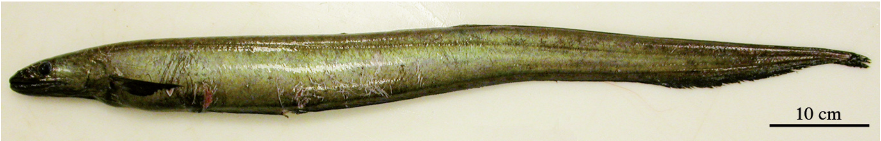

Figure 1. - *Diastobranchus capensis* (ZMUB 16181) caught near Spitsbergen in 2005, photographed on board with colours still intact.

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Table I. - Morphometric and meristic characters of the *Diastobranchus capensis* specimen caught near Spitsbergen in 2005. $^{(1)}$: Counted from radiograph.

Morphometric characters	
Total length	894 mm
Standard length	97.5% TL
Predorsal length	35.9% TL
Preanal length	21.7% TL
Head length	12.8% TL
Jaw length	7.9% TL
Snout length	4.3% TL
Eye diameter	1.9% TL
Interorbital width	2.2% TL
Pectoral fin length	8.2% TL
Body depth	8.5% TL
Gill slit length	1.9% TL
Meristic characters	
Lateral line pores	161
Lateral line pores to level of anus	27
Vertebrae$^{(1)}$	169
Dorsal fin rays$^{(1)}$	352
Anal fin rays$^{(1)}$	345

The specimen had an old, since long healed injury in the anterior part of the dorsal fin. The injury separated the first 13 finrays, which were connected with fin membrane, into a section detached from the rest of the dorsal fin. The 14th finray was broken near the base, and the next three finrays were missing, but the radiograph showed all pterygiophores to be intact.

Diastobranchus capensis has a circumglobal distribution on the continental slopes in subtropical and temperate waters of the Southern Hemisphere (Sulak and Shcherbachev, 1997), thus the present record was made extremely far north of the species normal range. Previous records on the Northern Hemisphere (Moore *et al*., 2003) have only been made on Bear Seamount (36°55'N-67°30'W), the Spitsbergen record also far north of this location.

The explanation for this extreme northern record will remain speculative: the species could be more common than previously recognized, even on the Northern Hemisphere, considering its distribution on depths not often fished by commercial fisheries and research cruises, and a risk of misidentification as e.g., the relatively common *Synaphobranchus kaupii*; the specimen could have been caught by a fishing vessel on more southern latitudes and discarded in the Arctic; or, it could have been brought to the area by abnormal currents conditions. The last suggestion may seem the more plausible, as an increased influx of Atlantic water has been recorded in the Norwegian Sea and Svalbard region after 2003, especially in 2005 (Ingvaldsen *et al.,* 2006). Following this influx, a number of temperate region fish species were caught in the Barents Sea and the waters around Svalbard in the years 2004-2009, such as *Entelurus aequoreus* (Rusyaev *et al*., 2007), *Nansenia groenlandica, Notoscopelus kroyeri*, *Lampanyctus macdonaldi, Notacanthus chemnitzii,* and *Coelorhynchus occa*, (unpubl.; kept in the collections of Bergen Museum). The latter two, like *D. capensis*, are deep-water species. While Robins and Robins (1989) suggest that the high latitude distribution of synaphobranchid eels may be limited by temperature tolerances of the leptocephalus larvae, Sulak and Shcherbachev (1997) point out that this does not hold for adults, which seem to have a tolerance for low temperatures, with registrations between -1.1 and 11.3°C. Specified temperature requirements for *D. capensis* seem unknown, but given its depth distribution, the species apparently lives mostly in temperature environments of no more than 3-4°C. If temperature tolerances of larvae and adults show differences as suggested, the present Arctic record of the species might also have been a case of adult migration by isothermal submergence, as suggested for a record of *Dissostictus eleginoides* near Greenland (Møller *et al*., 2003).

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